

REMARKS

Applicant has carefully studied the outstanding Office Action in the present application. The present response is intended to be fully responsive to all points of rejection raised by the Examiner and is believed to place the application in condition for allowance. Favorable reconsideration and allowance of the application are respectfully requested.

Claims 1, 3, 6-7, 9-10, 30, 32, 35-36, 38-39, 42, 59-69, 71, 74-75, 77-78, 98, 100, 103-104, 106-107 and 127-136 stand rejected under 35 U.S.C. 102(e) as being anticipated by Tabuchi et al (U.S. 2004/0078399). Claims 2, 4-5, 8, 11-29, 31, 33-34, 37, 40-41, 43-58, 70, 72-73, 76, 79-97, 99, 101-102, 105 and 108-126 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Tabuchi in view of Kern (U.S. 6,463,501).

Tabuchi et al describes a data duplicating system and method. Kern describes a system, method and program for maintaining data consistency among updates to data storage areas.

Applicant expresses his appreciation to Examiner Christopher S. McCarthy for the courtesy of an interview, which was granted to Applicant and Applicants' representative, Sanford T. Colb (Reg. No. 26,856). The interview was held in the USPTO on July 20, 2005. The substance of the interview is set forth in the Interview Summary.

In the interview, the patentability of claims 1, 30, 69 and 98 was discussed vis-à-vis the prior art of Tabuchi et al. The Interview Summary Record states, in relevant part, "Applicant and Examiner has agreed that an amendment would be proper to overcome the reference of Tabuchi. The amendment is to contain the language of the data storage to be on a

permanent storage component. This amendment was agreed to be presented in an upcoming RCE.”

Applicant has accordingly amended claims 1, 30, 69 and 98 to include the recitation “at least one data recovery storage device comprising a permanent storage component.”

Support for the amendments to the claims is found in Fig. 10B, step 218 and in paragraph 100 of the application as filed, which corresponds to paragraph 102 of the application as published.

Applicant respectfully submits that the prior art of Tabuchi does not show or suggest the data backup and recovery system and method of amended claims 1, 30, 69 and 98 as explained hereinbelow.

Applicant respectfully submits that the data backup and recovery system and method of the present invention, as recited in claims 1 and 69, includes at least one data recovery device ... for storing data on at least one data recovery storage device comprising permanent storage in a manner which enables reconstruction of a complete sequence of data communications ... and enables reconstruction of a representation of the data communications at a given earlier time **but does not require that the data be sent to the at least one permanent data recovery device in a given order and stored on said at least one permanent data recovery storage device in a given order.** Thus, the present invention allows data to be sent to the data recovery device in a random order and stored on the data recovery device in a random order. These two properties are hereinafter referred to as ‘random send property’ and ‘random store property.’

As describes further hereinbelow, the prior art of Tabuchi requires data to be sent to data recovery storage devices comprising permanent storage in a specific order and stored in a specific order on the data recovery storage devices comprising permanent storage. Therefore, Tabuchi does not show a system and method including a random send property and a random receive property, as recited in claims 1 and 69.

In his rejection of claim 1, the Examiner cited paragraphs 30, 36 and 40 of Tabuchi as describing a system including a ‘random send property’ and a ‘random store property.’ Applicant respectfully submits that paragraphs 30 and 36 of Tabuchi do not refer to sending data to permanent data storage recovery devices and storing data thereon, rather they describe sending of data to cache memory and control memory and storing of data therein. Applicant further submits that paragraph 40, which describes storing data in the data storage recovery device, describes storing the data only in a sequence which is the exact same order as it was stored in the first storage subsystems group: “the update sequences of the data D1 and D3 of the disk subsystem 7-1, and the data D2 and D4 of the disk subsystem 7-2, of which given time stamps are justified, will be the sequences of updates **in the order of the data D1 and D3 of the disk subsystem 3-1 and the data D2 and D4 of the disk subsystem 3-2**”. It is clear from this text that Tabuchi does not teach the *random store property* for data recovery storage devices comprising permanent storage.

Additionally, paragraph 38 of Tabuchi, which describes sending the data to the data storage device, describes sending the data only in sequence: “The disk subsystem 3-1 issues write commands on each of the data to the disk subsystem 7-1 after storing the received data into the cache memory 12 **in the sequence of the serial numbers**. The disk subsystem 3-2 issues write commands to the disk subsystem 7-2 on each of the data after storing the received data into

the cache memory 12 **in the sequence of the serial numbers.**” It is clear from this text that Tabuchi does not teach the *random send property*.

As discussed hereinabove, Applicant respectfully submits that Tabuchi does not show the *random send property* and *random store property* for data recovery storage devices comprising permanent storage as recited in claims 1 and 69. Claims 1 and 69 are therefore not anticipated by Tabuchi.

Applicant further submits that the *random send property* and *random store property* as recited in claims 1 and 69 are not obvious in view of Tabuchi, as discussed further hereinbelow.

Tabuchi describes a system and method where data transfer occurs at the disk subsystem level (paragraph 25) and the disk subsystem monitors updates (paragraph 34) and propagates them to the remote disk subsystem (paragraph 35). As known in the art, disk subsystems are designed for efficiently handling host to disk data transfer, which is usually a relatively reliable short distance transfer. Therefore, disk subsystems don’t have enough resources (memory, processing, etc.) to maintain and manage data transfer in any order that is not sequential. Thus, Tabuchi does not suggest the *random send property*.

The present invention addresses this problem by introducing a monitoring server (24 in the figures) and placing the monitoring server in various locations in the system and/or embedding them in various types of devices (paragraphs 54-63 of the present application). This novel concept enables the design of a monitoring server with the resources and the logic to support unordered data transfer and/or to leverage the resources/capabilities of devices that are inherently designed to support an unreliable long distance transfer. Thus, this novel concept enables the *random send property*.

Two additional issues must be addressed to support unordered data storage: 1) Recovery from corruptions in the case of failures in the remote center during the process of storing data in non-sequential order and 2) Enabling reconstruction of a consistent representation of the data image while supporting multiple updates to the same block. If this issue is not addressed, an earlier update to a block can overwrite a later update to the same block.

Applicant respectfully submits that since Tabuchi does not address either of these issues and Tabuchi does not suggest a system and method including a *random store property*.

The present invention addresses the first issue by introducing the concept of LOG and specifically how to use the LOG to recover from corruptions in the case of failures in the remote center (paragraphs 22-28 of the present application) and the second issue by introducing a procedure that enables the identification and elimination of certain updates to maintain consistent representation of the data image while supporting multiple updates to the same block (paragraph 101). Thus, this novel concept enables the *random store property*.

As discussed hereinabove, Applicant respectfully submits that Tabuchi does not show or suggest a system and method including a *random send property* and *random store property* as recited in claims 1 and 69. Claims 1 and 69 are therefore deemed to be allowable.

Applicant further submits that Tabuchi does not show or suggest a data backup and recovery system and method including at least one data recovery device being operative to receive ... information and to store data on said at least one data recovery storage device comprising permanent storage in parallel and not requiring that the data be received by the at least one data recovery device in a given order, as recited in claims 30 and 98. Claims 30 and 98 are therefore deemed to be allowable.

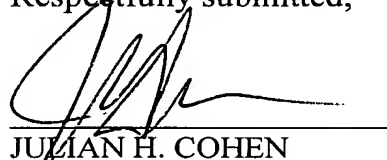
As discussed hereinabove, none of the prior art, either alone or in combination,

shows or suggests the claimed subject matter of amended claims 1, 30, 69 and 98. Claims 1, 30, 69 and 98 are therefore deemed to be allowable.

Claims 2-29 and 59-68 depend from claim 1 and recite additional patentable matter and are therefore deemed allowable. Claims 31-58 depend from claim 30 and recite additional patentable matter and are therefore deemed allowable. Claims 70-97 and 127-136 depend from claim 69 and recite additional patentable matter and are therefore deemed allowable. Claims 99-126 depend from claim 98 and recite additional patentable matter and are therefore deemed allowable.

In view of the foregoing, all of the claims are deemed to be allowable. Favorable reconsideration and allowance of the application are respectfully requested.

Respectfully submitted,



JULIAN H. COHEN
c/o Ladas & Parry LLP
26 West 61st Street
New York, New York 10023
Reg. No. 20302
Tel. No. (212) 708-1887